

### **Detergent compositions that solidify without heat, pressure or water**

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SO Jpn. Kokai Tokkyo Koho, 10 pp.  
PI JP 09176691 A2 19970708 Heisei  
AI JP 95-333633 19951221

DT Patent

LA Japanese

AB The title compns. contain metal ion sequestering agents and detergents, in the form of solid particles, and at least a portion of the detergent is used in hydrated form. A compn. (100 g) from Na tripolyphosphate 30, Na metasilicate-9H<sub>2</sub>O 10, and NaOH 42 parts was allowed to solidify in a 500-mL plastic container for 1 day to give a detergent showing good detergency in dishwashing.

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IC ICM C11D007-06

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CC 46-6 (Surface Active Agents and Detergents)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09176691	A2	19970708	JP 1995-333633	19951221
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500-mL plastic container for 1 day to give a detergent showing good  
detergency in dishwashing.

ST dishwashing detergent sequestering agent

IT Detergents

Sequestering agents

(detergent compns. that solidify **without heat**,  
pressure or water)

IT Detergents

(dishwashing; detergent compns. that solidify **without**  
**heat**, pressure or water)

IT 60-00-4, EDTA, uses 497-19-8, Sodium carbonate, uses 1310-73-2,  
Sodium

hydroxide, uses 1344-09-8, Sodium silicate 5064-31-3, Trisodium  
nitrilotriacetate 6132-02-1, Sodium **carbonate**

**decahydrate** 7727-73-3, Sodium **sulfate**

**decahydrate** 7757-82-6, Sodium sulfate, uses 7758-29-4, Sodium  
tripolyphosphate 13517-24-3, Sodium metasilicate nonahydrate

RL: TEM (Technical or engineered material use); USES (Uses)

(detergent compns. that solidify **without heat**,  
pressure or water)

=>

DERWENT-ACC-NO: 1997-399909  
DERWENT-WEEK: 200253  
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TITLE: Detergent composition for cleaning hard surfaces - contains sequestering agent and cleaner and comprises aggregates of granular particles

PATENT-ASSIGNEE: TEEPOL KK[TEEPN]

PRIORITY-DATA: 1995JP-0333633 (December 21, 1995)

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ABSTRACTED-PUB-NO: JP 09176691A

BASIC-ABSTRACT: Detergent composition contains a sequestering agent and a cleaner and comprises aggregates of granular solid particles. It contains a hydrated part at least partially and solidifies naturally without heating and pressurising to form a solid cleaner.

Preferably the composition contains 5-50 wt.% alkali metal phosphate as a sequestering agent and 1-50 wt.% alkali metal hydroxide and 5-50 wt.% alkali metal silica of formula  $xM_2O.ySiO_2.zH_2O$  (I) as cleaner ingredients,  $x, y = -.25:1-5:1, z = 1, 5 \text{ or } 9, M = \text{potassium or sodium}$ .

Alternatively composition contains 5-50 wt.% alkali metal phosphate as a sequestering agent and 1-50 wt.% alkali metal hydroxide and 5-50 wt.% sodium sulphate decahydrate and/or sodium carbonate decahydrate as cleaner ingredients or contains 5-50 wt.% alkali metal phosphate as a sequestering agent and 1-50

wt.% (1) and 5-50 wt.% sodium sulphate decahydrate and/or sodium carbonate decahydrate as cleaner ingredients. The composition has an average particle size of 0.1-1.5 mm. (I) is sodium metasilicate monohydrate.

USE - The composition is used as a solid cleaner for cleaning hard surfaces, especially tableware, in hotels, restaurants, hospitals and cafeterias.

ADVANTAGE - The composition solidifies without heating and pressurising for use as a solid cleaner having relatively low density and high solubility.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS:

DETERGENT COMPOSITION CLEAN HARD SURFACE CONTAIN SEQUESTER  
AGENT CLEAN COMPRISE  
AGGREGATE GRANULE PARTICLE

DERWENT-CLASS: D25

CPI-CODES: D11-B11; D11-D01B;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1287U; 1543U ; 1744U

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1997-128925

## \* NOTICES \*

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W/ glossed  
no listing  
anyone

## CLAIMS

[Claim(s)]

[Claim 1] The cleaning agent constituent which is a cleaning agent constituent containing a sequestering agent and a cleaning agent, and is characterized by the thing of the above-mentioned cleaning agent which a hydrate is used in part at least and done for natural solidification under un-heating and pressureless while the whole constituent consists of the aggregates of a powder particulate-solid particle.

[Claim 2] The cleaning agent constituent according to claim 1 which a phosphoric acid alkali-metal salt contains five to 50% of the weight as the above-mentioned sequestering agent, and the silicic acid alkali-metal salt in which a hydroxylation alkali-metal salt is shown with the following chemical formula (1) one to 50% of the weight as the above-mentioned cleaning agent contains five to 50% of the weight.

[Formula 1]  $xM_2O \cdot ySiO_2$  and  $zH_2O$  .... (1)

[ however x, and y and z are the number of addition mols. x:y is 0.25:1-5:1. z is the integer of 1, 5, or 9. Moreover, M is a potassium or sodium. ]

[Claim 3] The cleaning agent constituent according to claim 2 whose above-mentioned silicic acid alkali-metal salt is a specific metasilicate and 9 monohydrate.

[Claim 4] The cleaning agent constituent according to claim 1 which a phosphoric acid alkali-metal salt contains five to 50% of the weight as the above-mentioned sequestering agent, and either [ at least ] a sodium sulfate and 10 monohydrate or a sodium carbonate and 10 monohydrate contains [ the hydroxylation alkali-metal salt ] five to 50% of the weight one to 50% of the weight as the above-mentioned cleaning agent.

[Claim 5] The cleaning agent constituent according to claim 1 which a phosphoric acid alkali-metal salt contains five to 50% of the weight, and either [ at least ] a sodium sulfate and 10 monohydrate or a sodium carbonate and 10 monohydrate contains [ the silicic acid alkali-metal salt shown with the following chemical formula (2) as the above-mentioned cleaning agent ] five to 50% of the weight one to 50% of the weight as the above-mentioned sequestering agent.

[Formula 2]  $xM_2O \cdot ySiO_2$  and  $zH_2O$  .... (2)

[ however x, and y and z are the number of addition mols. x:y is 0.25:1-5:1. z is the integer of 0, 1, 5, or 9. Moreover, M is a potassium or sodium. ]

[Claim 6] The cleaning agent constituent according to claim 5 whose above-mentioned silicic acid alkali-metal salt is a silicic acid alkali-metal salt shown with the following chemical formula (3).

[Formula 3]  $xM_2O \cdot ySiO_2$  and  $zH_2O$  .... (3)

[ however x, and y and z are the number of addition mols. x:y is 0.25:1-5:1. z is the integer of 1, 5, or 9. Moreover, M is a potassium or sodium. ]

[Claim 7] The cleaning agent constituent according to claim 5 whose above-mentioned silicic acid alkali-metal salt is a silicic acid alkali-metal salt shown with the following chemical formula (4).

[Formula 4]  $xM_2O \cdot ySiO_2$  and  $zH_2O$  .... (4)

[ however x, and y and z are the number of addition mols. x:y is 0.25:1-5:1. z=0. Moreover, M is a potassium or sodium. ]

[Claim 8] A cleaning agent constituent given in any 1 term of the claims 1-7 by which the mean particle diameter of the whole constituent is set as 0.1-1.5mm.

[Translation done.]

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the cleaning agent constituent which fitted washing of \*\*\*\*\*, such as a metal, glass, pottery, and plastics, and was suitable for using especially as a solid cleaning agent.

[0002]

[Description of the Prior Art] In order to wash the tableware after use efficiently in the dining-room of a hotel, a restaurant, a meal company, a hospital, and a company etc. from the former, the automatic dish washer is used widely. Moreover, also not only at food but at various plants, a processing plant, etc., in order to wash an instrument, a container, the plastics container used for circulation, the automatic soaping machine is used. The thing of the method using a powder cleaning agent as these automatic soaping machines is known from the former.

[0003] However, since a powder cleaning agent must be periodically thrown into the detergent injector connected to the above-mentioned automatic soaping machine and the powder of a cleaning agent disperses in that case, adhesion and suction of the powder to an operator's skin arise, and the thing using the above-mentioned powder cleaning agent poses a health administration top problem. Moreover, although it dissolves in water or hot water within equipment and the above-mentioned powder cleaning agent is poured in into a washing tub as a liquid, the problem of being difficult has also dissolved uniformly the dissolution concentration of each component of a powder cleaning agent.

[0004] On the other hand, replacing with a powder cleaning agent and using a liquid cleaning agent is proposed. However, the above-mentioned liquid cleaning agent does not have a possibility of dispersing like powder, and while it is sanitary, it has the problem that the rate of a solvent is high and comparatively a lot of cleaning agents are [ the rate of an active principle ] needed for a low reason. For this reason, an exchange unit serves as a heavy lift, and a great space is taken to keep this while exchange work is not easy. Moreover, since the thick polyethylene containers used widely by hold of a liquid cleaning agent are fire retardancy and difficulty resolvability, the abandonment processing poses a problem.

[0005] Then, using a solid cleaning agent in recent years is proposed, and the object for prizes is partly carried out. According to this method, it has sanitarily the advantage that a high-concentration cleaning agent can be supplied by uniform concentration. And since a compact paper carton can be used, handling is easy, and there is also few storage space and they ends. Moreover, processing of a container is also easy. From these advantages, the increase of need to a solid cleaning agent is expected.

[0006] Although the above-mentioned solid cleaning agent has the common method of carrying out heating fusion of the cleaning agent constituent containing a high-concentration cleaning agent, carrying out cooling solidification of this, and acquiring, if heating melting is performed, it has become [ that there is a possibility that the bad cleaning agent component of thermal stability may pyrolyze, that for this reason do not perform heating melting, or make heating temperature low as much as possible, and the energy cost for heating solidifies a cleaning agent constituent efficiently, and ] with the important technical problem. Various kinds of things, such as a solid solid-state casting detergent constituent (JP, 59-4480, B) to which spray water and solid-state components are made to bind from such a viewpoint after carrying out casting of two kinds of formed elements, while it has been granular, and a cleaning agent constituent (\*\*\*\*\* No. 505280 [ six to ] official report) which can solidify the whole, without blending water restrictively and going via a heating melting process, are proposed.

[0007]

[Problem(s) to be Solved by the Invention] However, there is nothing that made combination of water zero completely in these constituents, and since all add a certain amount of water or it is adding by making a specific component into the form of a solution, it has the problem that it is difficult to make moisture die and cross to the whole constituent, and the problem that the rate of water and other components is delicate and manufacture of a constituent is difficult.

[0008] It was made in view of such a situation, and the whole constituent consists of particles, without moreover completely adding water, it carries out un-heating and this invention sets offer of a completely new cleaning agent constituent which it is pressureless and carries out natural solidification as the purpose.

[0009]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the cleaning agent constituent of this invention is a cleaning agent constituent containing a sequestering agent and a cleaning agent, and it takes the composition of the above-mentioned cleaning agent of a hydrate being used in part at least and carrying out natural solidification under un-heating and pressureless while the whole constituent consists of the aggregates of a powder particulate-solid particle.

[0010] In addition, the thing of the compound with which the above "a hydrate" contains water in the form of a molecule is said.

[0011] Below, the gestalt of implementation of this invention is explained.

[0012]

[Embodiments of the Invention] As a sequestering agent used for this invention, a phosphoric acid alkali-metal salt is suitable, and orthochromatic phosphoric acid, a polyphosphoric acid, a pyrophosphoric acid, a metaphosphoric acid, a hexa metaphosphoric acid, etc. are raised as the above-mentioned phosphoric acid. Moreover, sodium, a potassium, etc. are raised as an alkali metal combined with these. And sodium tripolyphosphate is suitable also in the above-mentioned phosphoric acid alkali-metal salt. In addition, an ethylene-diamine-tetraacetic acid salt, nitrilotriacetic acid 3 sodium salt, etc. can be used in addition to a phosphoric acid alkali-metal salt.

[0013] Moreover, as a cleaning agent used for this invention, various kinds of salts, such as a hydroxylation alkali-metal salt, a silicic acid alkali-metal salt, a sulfate, and a carbonate, are raised.

[0014] A sodium hydroxide, a potassium hydroxide, etc. are raised as the above-mentioned hydroxylation alkali-metal salt.

[0015] Moreover, what is shown with the following chemical formula (5) as the above-mentioned silicic acid alkali-metal salt is suitable, and x:y of the following [ point / of a washing performance and dispersibility ability ] is suitable for the thing of 1:1-3:1, especially 1:1-2:1 especially. For example, a specific metasilicate and 9 monohydrate is desirable. Moreover, an anhydrous specific-metasilicate and 11 specific silicate, a stratified specific silicate (SKS-6, Hoechst A.G. make), etc. can also be used.

[0016]

[Formula 5]  $xM_2O \cdot ySiO_2$  and  $zH_2O \dots (5)$

[ however x, and y and z are the number of addition mols. x:y is 0.25:1-5:1. z is the integer of 0, 1, 5, or 9. Moreover, M is a potassium or sodium. ]

[0017] Furthermore, as the above-mentioned sulfate, a sodium sulfate and 10 monohydrate etc. is suitable, and a sodium carbonate and 10 monohydrate, a sodium hydrogencarbonate, a sodium sesquicarbonate, etc. are suitable as the above-mentioned carbonate.

[0018] In addition, a proper additive can be blended with the cleaning agent constituent of this invention outside the above-mentioned sequestering agent and a cleaning agent if needed.

[0019] For example, anhydrous sodium sulfate, an anhydrous sodium carbonate, anhydrous potassium carbonate, etc. can be used as a builder for the improvement in a detergency. Moreover, carboxylates, such as a sodium citrate, a sodium gluconate, sodium tartrate, malic-acid sodium, and sodium succinate, etc. can be used. As other organic builders, furthermore, ethane -1, 1-diphosphite, An ethane-1,1,2-triphosphonic acid salt, ethane-1-hydroxy -1 and 1-diphosphite and its derivative, Ethanehydroxy-1,1,2-triphosphonic acid, ethane -1, 2-dicarboxy -1, 2-diphosphonic acid, Phosphonic acid, such as methane hydroxy phosphonic acid, 2-phosphono butane -1, 2-dicarboxylic acid, 1-phosphono butane - Amino acid salts, such as phosphono carboxylates, such as 2, 3, 4-tricarboxylic acid, and alpha-methyl phosphono succinic acid, an aspartic acid, and glutamic acid, etc. can be used.

[0020] Moreover, oxygen system oxidizers, such as chlorine-based oxidizers, such as chloro isocyanuric acid chloride, and a fault sodium carbonate, fault way acid sodium, fault phthalic-acid sodium, etc. can be used the making the bleaching effect give purpose.

[0021] Furthermore, a surfactant can be used in order to raise emulsification distribution of dirt. As the above-mentioned surfactant, the thing of low \*\*\*\* is desirable. For example, a polyoxyethylene polyoxypropylene polymerization object, A phosphoric ester, polyoxyethylene polyoxypropylene alkyl ether, Polyoxyethylene alkyl phenyl ether, polyoxyethylene sorbitan fatty acid ester, Polyoxyethylene sorbitol fatty acid ester, polyethylene glycol fatty acid ester, Polyoxyethylene castor oil, polyoxyethylene alkylamine, a glycerine fatty acid ester, a higher-fatty-acid alkanol amide, alkyl glucoside, an alkylamine oxide, etc. are raised.

[0022] Moreover, non-dissociating polymeric materials, such as a polyethylene glycol, polyvinyl alcohol, and a polyvinyl pyrrolidone, a carboxymethyl cellulose, xanthan gum, etc. can be used as a dispersant.

[0023] Furthermore, in order to heighten the cleaning effect to oil dirt, solvents, such as a monoethanolamine, a diethanolamine, a triethanolamine, a N-methyl-2-pyrrolidone, a diethylene glycol monoethyl ether, the diethylene-glycol monomethyl ether, the diethylene-glycol monobutyl ether, the triethylene-glycol monoethyl ether, the triethylene-glycol monobutyl ether, the tetraethylene-glycol monomethyl ether, and the tetraethylene-glycol monoethyl ether, can be blended.

[0024] Moreover, well-known components, such as a bleaching activator, a high DOROTO rope agent, a silicone system defoaming agent, perfume, a coloring agent, and a corrosion inhibitor, can also be blended.

[0025] Furthermore, in order to heighten the solidification effect of a constituent, an organic-electrolyte macromolecule polymer can be used. As such an organic-electrolyte macromolecule polymer A polyacrylic acid, the poly aconitic acid, the poly itaconic acid, the poly citraconic acid, The poly fumaric acid, a polymer lane acid, a polymeter contest acid, a Polly alpha-hydroxy acrylic acid, Polyvinyl phosphonic acid, a sulfonation polymer lane acid, a maleic-anhydride diisobutylene copolymer, A maleic-anhydride styrene copolymer, a maleic-anhydride methyl-vinyl-ether copolymer, A maleic-anhydride ethylene copolymer, a maleic-anhydride ethylene crosslink copolymer, A maleic-anhydride vinyl acetate copolymer, a maleic-anhydride acrylonitrile copolymer, A maleic-anhydride acrylic-ester copolymer, a maleic-anhydride butadiene copolymer, A maleic-anhydride isoprene copolymer, a maleic anhydride and the Polly beta-keto carboxylic acid guided from a carbon monoxide, An itaconic-acid ethylene copolymer, an itaconic-acid aconitic-acid copolymer, an itaconic-acid maleic-acid copolymer, An itaconic-acid acrylic-acid copolymer, a malonic-acid methylene copolymer, an itaconic-acid boletic acid copolymer, an ethylene glycol ethylene

terephthalate copolymer, a vinyl-pyrrolidone vinyl acetate copolymer, etc. are raised. Even if it uses these independently, they may use two or more sorts together. Also in these, independent, or the polymer and copolymer which it comes to combine are suitable in the Al Lil acid, a maleic acid, a methacrylic acid, boletic acid, an itaconic acid, etc.

[0026] The cleaning agent constituent of this invention is obtained by blending each of these components suitably. However, each of each components must be prepared as a powder particulate-solid particle. That is, in this invention, by making particles bind, a fixed configuration is made to carry out natural solidification of the whole, and water or solution is not blended at all with the moisture contained in the hydrate mentioned later. This is the big feature of this invention. In addition, in order to solidify a constituent uniformly, it is suitable to set the mean particle diameter of the whole constituent as 0.1-1.5mm. Moreover, it is desirable to make it the maximum droplet size of each particle which constitutes a constituent not exceed 2mm from the same meaning.

[0027] the above-mentioned powder -- the hydrate for carrying out natural solidification of the granular constituent -- some cleaning agents -- or all are supposed and it is used The cleaning agent constituent of the composition which contains 5 - 50% of hydrates as an example of the desirable composition containing the above-mentioned hydrate among the silicic acid alkali-metal salts which are shown as a sequestering agent by 5 - 50 % of the weight (it abbreviates to "%" below) of phosphoric acid alkali-metal salts, and are indicated to be 1 - 50% of hydroxylation alkali-metal salts with the aforementioned chemical formula (5) as a cleaning agent is raised.

[0028] As a sequestering agent, moreover, as 5 - 50% of phosphoric acid alkali-metal salts, and a cleaning agent the cleaning agent constituent of composition of 1 - 50% of hydroxylation alkali-metal salts, and a sodium sulfate and 10 monohydrate and a sodium carbonate and 10 monohydrate, on the other hand, using 5 - 50% at least -- similarly as 5 - 50% of phosphoric acid alkali-metal salts, and a cleaning agent The cleaning agent constituent of composition using either [ 1 - 50% of silicic-anhydride sodium, and / at least ] a sodium sulfate and 10 monohydrate or a sodium carbonate and 10 monohydrate, Furthermore, the cleaning agent constituent of composition using the hydrate etc. is suitable among the silicic acid alkali-metal salts which are the same composition as the above, replace with silicic-anhydride sodium, and are shown with the aforementioned chemical formula (5).

[0029] In addition, in the cleaning agent constituent of this invention, when blending liquefied components (non-water), such as the aforementioned surfactant, it is suitable to set up the blending ratio of coal to 10% or less. And it is suitable to set it as 0.1 - 4.0% of within the limits especially from the point of emulsification dispersibility and washing nature.

[0030] Thus, the obtained cleaning agent constituent secedes from the crystal structure to which the moisture contained in the above-mentioned hydrate has incorporated this at the time of constituent stirring mixture since the hydrate is used for some or all of a cleaning agent, it oozes out outside, and humidity of each particle is carried out with time. For this reason, the particles which carried out humidity bind mutually and, finally the whole carries out natural solidification. Although this natural solidification time is based on the amount of the whole constituent, a 100g constituent is usually solidified completely in 1 - 5 hours for less than at most 24 hours, for example. Therefore, in order to obtain a solid cleaning agent conventionally, according to the cleaning agent constituent of this invention the place which needed operation of adding water and solution of a constant rate for the powder granular constituent, by liquefying by heating melting, cooling after casting and solidifying the whole These operations become unnecessary and the solid cleaning agent made into the purpose can be easily obtained only by being filled up with a powder granular constituent in a predetermined mold (container), and leaving it, after carrying out stirring mixture. For this reason, a manufacturing cost can be held down low. Moreover, since heating is not required, the solid-state cleaning agent which did not spoil the performance of the bad component of thermal stability and was excellent in the detergency can be offered. Furthermore, since water is not blended at all into a constituent, the highly efficient component which is easy to understand an added water part which was not able to be used conventionally can also be used now, and a detergency can be raised further. And since the solid cleaning agent obtained by doing in this way is not pressurized but particles are only binding it to the mutual front face, between particles, a delicate opening remains and it turns into a solid cleaning agent with light specific gravity. Incidentally, the specific gravity is 0.9-1.4, and the solid cleaning agent obtained using the cleaning agent constituent of this invention has it compared with the conventional thing (specific gravity 1.5-2). [ light ] Therefore, when using it, loading an automatic tableware scrubber etc. with this solid cleaning agent, and making it dissolve in water or hot water, compared with the conventional thing, it is easy to dissolve, and has the advantage of being user-friendly.

[0031] Below, it combines with the example of comparison and an example is explained.

[0032]

[Examples 1-8] The cleaning agent constituent was prepared by the composition (a unit is the same also in the weight section and the following tables) shown in the following table 1 and Table 2. In addition, while preparing the particle size of each component and making it the mean particle diameter of the whole constituent set to 0.8mm, it was made for the diameter of grain of maximum size not to exceed 1.5mm. And after filling up every 100g 250ml plastic envelope with each sample and sealing it, it put at the room temperature (20-25 degrees C) on the 1st. Next the container with which it filled up with the above-mentioned cleaning agent constituent was made 180-degree reverse, the grade of solidification of contents was evaluated as follows, and the result was collectively shown in the after-mentioned table 1 and Table 2.

[Evaluation of solidification]

O -- It does not collapse, even if it shakes by making it reverse.

O -- Although it will collapse in part if it shakes by making it reverse, it can hold, if it does not shake.

\*\* -- It collapses in part only by making it reverse.



x -- If it is made reverse, the whole will collapse.

[0033] Moreover, the well-known solid cleaning agent charge type automatic dish washer (JWD-6, Ishikawajima-Harima Heavy Industries Co., Ltd. make) was conventionally loaded with what the above-mentioned sample solidified, tableware washing was actually presented with it on condition that the following, and the detergency was evaluated as follows. The result was also collectively shown in the after-mentioned table 1 and Table 2.

[Setups of a detergency]

- A standard washing cycle and detergent concentration 0.12% and washing temperature 55 degree C and rinsing temperature 80 degree C and use water degree of hardness (as CaCO<sub>3</sub> concentration) the 70-75 ppm [evaluation technique] margarine 70 section -- a suitable container -- putting in -- warming, after dissolving What added the powdered milk 15 section, the non-fat milk 5 section, and the wheat flour 10 section, dissolved uniformly, added the water 30 section further, and was made into the shape of a paste was used as standard dirt. And the above-mentioned standard dirt was made to adhere to an earthenware pan with a diameter of 20cm so that it may become 8g / one sheet, and it was dried in ordinary temperature for 1 hour. And after washing it on condition that the above, having used as 10 sets [ 1 ] the pan which carried out in this way and was soiled, viewing estimated the dirt omission condition as follows.

O -- [ -- 50 - 70% dirt removal x / -- Less than 50% of dirt removal. ] 90% or more dirt removal O -- 70 - 90% dirt removal \*\*

[0034]

[Table 1]

		実 施 例			
		1	2	3	4
金属イオン封鎖剤： トリポリリン酸ナトリウム		3 0	3 0	3 0	3 0
水 化 物	メタ珪酸ナトリウム・9水塩	1 0	--	--	--
	硫酸ナトリウム・10水塩	--	1 0	--	5
	炭酸ナトリウム・10水塩	--	--	1 0	5
無 水 物	水酸化ナトリウム	4 2	4 2	4 2	4 2
	無水珪酸ナトリウム	--	--	--	--
	無水硫酸ナトリウム	--	--	--	--
	無水炭酸ナトリウム	--	--	--	--
評 価	固化の程度	◎	◎	◎	◎
	洗浄性	◎	◎	◎	◎

[0035]

[Table 2]

		実 施 例			
		5	6	7	8
金属イオン封鎖剤： トリポリリン酸ナトリウム		30	30	30	30
水 化 物	メタ珪酸ナトリウム・9水塩	5	5	--	10
	硫酸ナトリウム・10水塩	5	--	10	10
	炭酸ナトリウム・10水塩	--	5	10	--
無 水 物	水酸化ナトリウム	--	--	--	--
	無水珪酸ナトリウム	--	--	30	20
	無水硫酸ナトリウム	--	--	--	10
	無水炭酸ナトリウム	--	--	--	20
評 価	固化の程度	◎	◎	◎	◎
	洗浄性	◎	◎	◎	◎

[0036]

[Examples 9-20] The cleaning agent constituent was prepared by the composition shown in following Table 3 - 5. In addition, a setup of the mean particle diameter of the whole constituent and its diameter of grain of maximum size was made to be the same as that of the above-mentioned example. And the grade and washing nature of the solidification were evaluated like the above-mentioned example, and the result was collectively shown in following Table 3 - 5.

[0037]

[Table 3]

		実 施 例			
		9	10	11	12
金属イ オン封 鎖剤	トリポリリン酸ナトリウム	--	--	5	50
	エチレンジアミンテトラ酢酸塩	20	--	--	--
	ニトリロ3酢酸3ナトリウム塩	--	20	--	--
メタ珪酸ナトリウム・9水塩		30	30	30	30
水酸化ナトリウム		35	--	42	14
無水珪酸ナトリウム		--	35	--	--
無水硫酸ナトリウム		--	--	23	6
評 価	固化の程度	◎	◎	◎	◎
	洗浄性	◎	◎	◎	◎

[0038]

[Table 4]

		実 施 例			
		1 3	1 4	1 5	1 6
金属イ オン封 鎖剤	トリポリリン酸ナトリウム	2 0	2 0	5 0	2 0
	エチレンジアミンテトラ酢酸塩	--	--	--	--
	ニトリロ 3 酢酸 3 ナトリウム塩	--	--	--	--
メタ珪酸ナトリウム・9水塩		5	5 0	4 9	1 1
水酸化ナトリウム		5 0	2 1	1	5 0
無水珪酸ナトリウム		--	--	--	--
無水硫酸ナトリウム		2 5	9	--	1 9
評 価	固化の程度	○	◎	◎	◎
	洗浄性	◎	◎	◎	◎

[0039]

[Table 5]

		実 施 例			
		1 7	1 8	1 9	2 0
金属イ オン封 鎖剤	トリポリリン酸ナトリウム	3 0	3 0	3 0	3 0
	エチレンジアミンテトラ酢酸塩	--	--	--	--
	ニトリロ 3 酢酸 3 ナトリウム塩	--	--	--	--
メタ珪酸ナトリウム・9水塩		2 0	2 0	2 0	2 0
水酸化ナトリウム		3 5	3 5	3 5	3 5
無水珪酸ナトリウム		--	--	--	--
無水硫酸ナトリウム		1 4.9	1 1	1 0	5
界面活性剤（ポリアルキレン重合体）		0.1	4	5	1 0
評 価	固化の程度	◎	◎	○	○
	洗浄性	◎	◎	◎	◎

[0040]

[Examples 21-27] The grain size of each component was prepared so that the mean particle diameter and the diameter of grain of maximum size of the whole constituent might serve as a value shown in the following table 6 and Table 7. The cleaning agent constituent made into the purpose was obtained like the aforementioned example 1 except it. And like the above-mentioned

example, the grade and washing nature of the solidification were evaluated and the result was collectively shown in the following table 6 and Table 7.

[0041]

[Table 6]

		実 施 例			
		2 1	2 2	2 3	2 4
組成物の平均粒子径 (mm)		0. 0 5	0. 1	0. 3	0. 8
最大粒子径 (mm)		1. 5	1. 5	1. 0	1. 5
評	固化の程度	◎	◎	◎	◎
価	洗浄性	◎	◎	◎	◎

[0042]

[Table 7]

		実 施 例		
		2 5	2 6	2 7
組成物の平均粒子径 (mm)		1. 2	1. 5	2. 0
最大粒子径 (mm)		2. 0	2. 0	2. 5
評	固化の程度	◎	◎	△
価	洗浄性	◎	◎	◎

[Effect of the Invention] As mentioned above, the hydrate is used for some or all of a cleaning agent, and in order for the moisture contained in this hydrate to carry out humidity of each particle with time, the whole solidifies the cleaning agent constituent of this invention automatically under un-heating and pressureless. Therefore, in order to obtain a solid cleaning agent conventionally, according to the cleaning agent constituent of this invention the place which needed operation of adding water and solution of a constant rate for the powder granular constituent, by liquefying by heating melting, cooling after casting and solidifying the whole. These operations become unnecessary and the solid cleaning agent made into the purpose can be easily obtained only by being filled up with a powder granular constituent in a predetermined mold (container), and leaving it, after carrying out stirring mixture. For this reason, a manufacturing cost can be held down low. Moreover, since heating is not required, the solid-state cleaning agent which did not spoil the performance of the bad component of thermal stability and was excellent in the detergency can be offered. Furthermore, since water is not blended at all into a constituent, the highly efficient component which is easy to understand an added water part which was not able to be used conventionally can also be used now, and a detergency can be raised further. And since the solid cleaning agent obtained by doing in this way is not pressurized but particles are only binding it to the mutual front face, between particles, a delicate opening remains and it turns into a solid cleaning agent with light specific gravity. Therefore, compared with the conventional solid cleaning agent, it is easy to dissolve, and has the advantage of being user-friendly.

[Translation done.]